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Applicant: Joseph P.R. Tosey

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Title: OPERATING SESSION REAUTHORIZATION IN A USER-OPERATED DEVICE

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CERTIFICATE UNDER 37 CFR 1.10

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BOX PATENT APPLICATION

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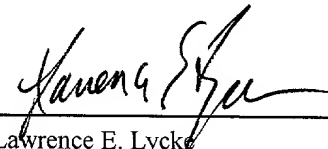
- ☒ Transmittal sheet, in duplicate, containing Certificate under 37 CFR 1.10.
- ☒ Utility Patent Application: Spec. 7 pgs; 34 claims; Abstract 1 pgs.
The fee has been calculated as shown below in the "Claims as Filed" table.
- ☐ Design Patent Application: Spec. _____ pgs.
- ☐ 2 sheets of drawings
- ☐ Certified copy of a _____ application, Serial No. _____, filed _____, the right of priority of which is claimed under 35 U.S.C. 119
- ☐ Small entity status will be established at a later date
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- ☒ A signed Combined Declaration and Power of Attorney
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- ☒ Assignment of the invention to Glenayre Electronics, Inc., Recordation Form Cover Sheet
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- ☐ Computer readable form of _____. Applicants state that the paper copy form of the _____ section of the present application, and the computer readable form submitted herewith, are the same.
- ☐ Other:
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CLAIMS AS FILED

Number of Claims Filed		In Excess of:		Number Extra		Rate		Fee
Basic Filing Fee								\$710.00
Total Claims								
34	-	20	=	14	x	22.00	=	\$308.00
Independent Claims								
3	-	3	=	0	x	78.00	=	\$0.00
MULTIPLE DEPENDENT CLAIM FEE								\$0.00
TOTAL FILING FEE								\$1018.00

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MERCHANT & GOULD P.C.
P.O. Box 2903, Minneapolis, MN 55402-0903
(612) 332-5300

By: 
Name: Lawrence E. Lycke
Reg. No.: 38,540
Initials: LEL:kh

(PTO TRANSMITTAL - NEW FILING)

OPERATING SESSION REAUTHORIZATION IN A USER-OPERATED DEVICE

Field Of The Invention

The present invention relates to user-operated devices and, more particularly, to authorization processes for use in user-operated devices.

Background Information

Some personal electronic devices such as, for example, personal computers (PCs), personal digital assistants (PDAs), and mobile phones include authentication processes to help ensure that only authorized users can operate the device. This feature is often used to prevent others from accessing confidential information available through the device and/or accumulating service charges for using the device (e.g., cell phones).

Some conventional authentication processes include (a) multi-step login processes, (b) biometrics units that can determine whether the user is authorized by sensing a physical feature of the user, and (c) security devices (e.g., encryption ring) that are physically carried by the user to "unlock" the personal computing device.

Currently, the multi-step login process is widely used. Typically, the multi-step login process begins when the device is powered on or reset. The device then prompts the user to enter a login name and password via a user interface (e.g., keyboard or keypad) before allowing the user to otherwise operate the device. Generally, the login name and the password must each include several characters. Using the user interface, the user then enters the several characters of the user's login name, and then enters the

several characters of the password. This process typically takes a relatively long time since the user must enter each character for the login name, move the cursor to another field for the password and then enter each character of the password. The device must then process the login name and password to determine if the user is an authorized user. If the user is an authorized user, the device then starts an operating session in which the user can operate the device in the normal manner.

An additional security feature of the multi-step login process is that the operating session will be terminated if the user does not operate the device for an extended period of time (sometimes referred to as an idle timeout). Once this occurs, in the conventional system, the user must then repeat the entire authorization period. As will be appreciated by many users, this process can be undesirable because the delay disrupts the user's train of thought and may even cause the device to enter a default "start-up" mode, leaving the state the device was in when the idle timeout occurred. Thus, it is desirable to implement a system in which a user can quickly and easily continue an operating session after an idle timeout.

Summary

In accordance with the present invention, an authorization-update process for use in a user-operated device is provided. According to one aspect of the present invention, an operating session of the user-operated device can be re-authorized after an idle timeout using the authorization-update process, which has fewer steps than the initial authorization process. In a further refinement, the re-authorization process requires only a single entry by the user in response to a prompt by the device to re-authorize the user and continue to the operating session. Thus, the authorization-update process is significantly faster than re-authorization in the conventional manner. In one embodiment, the prompt includes a display of several characters or icons. The user then selects the character or icon that was preselected to re-authenticate the user, thereby continuing the operating session from the same point at which the idle timeout occurred. In a further aspect, the user has a predetermined time period to select the correct character or icon to continue the operation session. Not meeting the time requirement or selecting a wrong character or icon will cause the device to require a full authorization process to enable the user to operate the device. This aspect of the invention allows the user to

quickly and easily re-authenticate the operating session, thereby avoiding significant disruptions in the operating session. Alternatively, the authorization update process may use the position of the cursor or a voice signal to re-authorize the operating session.

Brief Description Of The Drawings

FIGURE 1 illustrates a block diagram of a user-operated device with an authorization-update module, according to one embodiment of the present invention.

FIGURE 2 illustrates a flow diagram of the operation of the user-operated device of FIGURE 1, according to one embodiment of the present invention.

FIGURE 3 illustrates a prompt for the authorization-update module, according to one embodiment of the present invention.

Detailed Description

FIGURE 1 a user-operated device 10 with an authorization-update module 11, according to one embodiment of the present invention. The authorization-update module is described below in conjunction with FIGURE 2. The term module is used herein can refer to software or hardware implementations of an authorization-update process. The user-operated device 10 can be a computer system, a PDA, a cell phone, or other electronic device that is to be operated by a user in authenticated operating sessions.

In this embodiment, the user-operated device 10 includes a control unit 12 and a user interface 14. The user interface 14 includes an input device 15 and an output device 16. For example, the input device 15 may be a keyboard or keypad, whereas the output device 16 may be a display such as a monitor or liquid crystal display (LCD). In addition, the input and output devices 15 and 16 may include a microphone and speaker for interfacing with the user in audio signals (e.g., voice recognition and activation techniques).

In this embodiment, the control unit 12 is also configured with a login module 17, similar to conventional login modules. The login module 17 includes an authentication module 18 and an idle timer 19. The idle timer 19 counts the time from the last time the user operated the device (e.g., operated the user interface). For example, the input device 15 may be a keypad, which resets the idle time each time the user activates a key. The control unit 12 monitors the idle timer 19 and detects when the predetermined idle timeout has been reached.

FIGURE 2 illustrates the operation of the user-operated device 10 (FIGURE 1), according to one embodiment of the present invention. Referring to FIGURES 1 and 2, user-operated device 10 operates as follows. In an operation 20, the user-operated device performs the authentication process. In this embodiment, the login module 17 prompts the user for a login name and password, as in some conventional user-operated devices. In response thereto, the user provides the login name and password, which the control unit 12 then verifies. If the user is an authorized user, the operation flows to operation 21. In operation 21, the control unit 12 monitors the idle timer 19 to detect when the user has left the device idle for a predetermined time period. In this embodiment, this predetermined time period is referred to as the rapid idle timeout. For example, the rapid idle timeout may be about ten minutes. In this embodiment, the rapid idle timeout is configurable, with values commonly ranging from one to thirty minutes or more. The rapid idle timeout can be configured by the user, at manufacture, etc.

In a next operation 22, if the rapid idle timeout is reached, the control unit 12 causes the user-operated device to enter a suspend mode, in which the operating session is suspended. In the suspend mode, the user-operated device will not respond to normal commands/input events via the user interface 14, but rather proceeds to an operation 24.

In operation 24, the update module 11 determines whether the user is still the authorized user. For example, the rapid idle period may have occurred because the authorized user is no longer in the vicinity, leaving the user-operated device 10 unattended. An unauthorized user may then attempt to operate the device 10. The update module 11 prevents a user from operating the device after the rapid idle timeout has been reached unless the user provides an authentication-update event within a second predetermined time period (i.e., the update timeout). One embodiment of an update-authorization event is described below in conjunction with FIGURE 3. In this embodiment, the rapid idle timeout is about ten minutes and the update timeout is about five seconds. If the authorization-update process is properly completed, the idle timer 19 is reset and the operational flow returns to operation 21. In accordance with the present invention, the update authorization process is significantly less complex than the authorization process of operation 20. This feature advantageously allows the authorized

user to continue the operating session without significant delay, without losing the current state of the user-operated device 10 and without losing the user's thought process.

If the authorization-update process is not properly completed within a third predetermined time period (normal idle timeout), a next operation 25 is performed. In operation 25, the operating session cannot be continued unless the login module 17 determines the user is an authorized user as described in operation 20. Thus, if the user-operated device 10 has been idle for a period less than the normal idle timeout but greater than the rapid idle timeout, operation 24 is performed to continue the operating session. However, if the user-operated device 10 has been idle for greater than the normal idle timeout, then operation 25 is performed to continue the operating session.

In alternative embodiment, if user does not perform the full authorization process with a fourth predetermined time period (powerdown idle timeout), the device enters a standby or inactive mode, in which the device can be shut down or placed in some other energy saving mode. The user must then perform some additional step or steps to proceed to operation 20. For example, the normal idle timeout may be one hour and the powerdown idle timeout may be five hours. Thus, in this example, the user may perform operation 25 to continue the operating session if the user-operated device has been idle for more than the normal idle timeout but less than the powerdown idle timeout. If the device is idle for more than the powerdown idle timeout, the user may be required to restart the user-operated device 10, after which the operational flow returns to operation 20.

FIGURE 3 illustrates a prompt for the authorization-update module 11 (FIGURE 1), according to one embodiment of the present invention. In this embodiment, the user interface 14 (FIGURE 1) implements the input device 15 (FIGURE 1) so as to include a mouse (not shown), and the output device 16 (FIGURE 1) to include a monitor (not shown) that can display characters and a cursor. After the rapid idle timeout, the authorization-update module 11 causes the user interface 14 to display characters 30, as a prompt for the authorization-update process. In one embodiment, the prompt is displayed when the user tries to operate the user-operated device 10 after the operating session was suspended. In response to the prompt, the user would then select or "click" a predetermined character that is being displayed, within the update timeout, to properly

complete the authorization-update process. In this example, there are eighty characters 30, thereby significantly decreasing the chance (i.e., one in eighty) that an unauthorized user will randomly select the proper authorization-update response. In an alternative embodiment, the authorization-update process may require the selection of two predetermined characters as the proper response. Thus, the probability of randomly selecting the correct two characters becomes $1/[(80)(79)]$. The user may also press the appropriate key of a keyboard (not shown) instead of using the cursor to select the predetermined character. Of course, in other embodiments, a different number of keyboard characters may be used. In addition, characters that are not commonly part of a keyboard can also be displayed. Still further, a plurality of icons, or a combination of icons and characters can be displayed. The user would then have to select the predetermined character or icon within the update timeout to complete the authorization-update process.

In yet another embodiment (not shown), the user interface 14 may also include a microphone, which is used to receive an acoustic voice signal from the user. In this alternative embodiment, the user would utter a predetermined word or phrase into the microphone to engage in the authorization-update process. The control unit 12 includes a voice recognition module (not shown) that determines whether the user is an authorized user. In this embodiment, the user would choose the predetermined word or phrase and train the voice recognition module to recognize the user's pronunciation. This embodiment significantly increases the number of possible predetermined responses to an authorization-update prompt.

In yet another alternative embodiment, the predetermined response is the placement of the cursor at a predetermined point on the monitor within the update timeout. Merely placing the cursor at this point, or alternatively, clicking on this point serves as the response to the prompt. The prompt itself may be an acoustic signal (e.g., a beep or other sound, or a phrase requesting the authorization-update response) in these alternative embodiments. Still further, the display of a screen saver may serve as the prompt in these embodiments.

In still another alternative embodiment, the predetermined response is the user looking at a predetermined character or icon displayed by the user interface, or a

predetermined location on a monitor of the user interface. The user-operated device includes a unit that monitors the user's eye or eyes and determines which point on the monitor that the user is viewing. For example, the Eyegaze technology available from LC Technologies, Inc., Fairfax, Virginia can be used.

The foregoing embodiments are intended to be illustrative of the principles of the present invention and are not intended to limit the invention to the particular embodiments described. Accordingly, while the preferred embodiment of the invention has been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention.

I Claim:

1. A method of authorizing a user to operate a user-operated device, the method comprising:
 - performing an authentication process to start an operating session;
 - detecting when the user is not operating the user-operated device;
 - suspending the operating session if the user has not operated the user-operated device for a first predetermined period;
 - continuing the operating session if the user performs an authentication-update process within a second predetermined time period after the operating session is suspended; and
 - continuing the operating session if the user performs the authentication process after the operating session is suspended and the second predetermined time period is exceeded.
2. The method of Claim 1 wherein the authentication process comprises:
 - prompting the user to provide a login entry;
 - receiving a login entry from the user;
 - prompting the user to provide a password;
 - receiving a password from the user; and
 - verifying that the received login entry and password correspond to an authorized user.
3. The method of Claim 1 further comprising providing a prompt that the operating session has been suspended.
4. The method of Claim 3 wherein the prompt comprises displaying a plurality of icons.
5. The method of Claim 3 wherein the prompt comprises entering a screen saver mode.
6. The method of Claim 3 wherein the prompt comprises an audio signal.

7. The method of Claim 1 wherein the authentication update process comprises inputting a predetermined signal to the user-operated device within the second predetermined time period.
8. The method of Claim 7 wherein inputting a predetermined signal comprises selecting a predetermined icon displayed by the user-operated device.
9. The method of Claim 7 wherein inputting a predetermined signal comprises selecting a predetermined character displayed by the user-operated device.
10. The method of Claim 7 wherein inputting a predetermined signal comprises placing a cursor at a predetermined coordinate on a display of the user-operated device.
11. The method of Claim 7 wherein inputting a predetermined signal comprises providing a predetermined audio voice signal to the user-operated device.
12. An apparatus for authorizing a user to operate a user-operated device, the apparatus comprising:
 - means for authenticating a user to start an operating session;
 - means for detecting when the user is not operating the user-operated device;
 - means for suspending the operating session if the user has not operated the user-operated device for a first predetermined period; and
 - means for updating authentication of the user and re-entering the operating session if the user updates authentication within a second predetermined time period.
13. The apparatus of Claim 12 wherein the means for authenticating comprises:
 - means for prompting the user to provide a login entry;
 - means for receiving a login entry from the user;
 - means for prompting the user to provide a password;
 - means for receiving a password from the user; and
 - means for verifying that the received login entry and password correspond to an authorized user.

14. The apparatus of Claim 12 further comprising means for providing a prompt that the operating session has been suspended.
15. The apparatus of Claim 14 wherein the prompt comprises displaying a plurality of icons.
16. The apparatus of Claim 14 wherein the prompt comprises entering a screen saver mode.
17. The apparatus of Claim 14 wherein the prompt comprises an acoustic signal.
18. The apparatus of Claim 12 wherein the means for updating authentication comprises means for receiving a predetermined signal from the user of the user-operated device.
19. The apparatus of Claim 18 wherein the means for receiving a predetermined signal comprises means for selecting a predetermined icon displayed by the user-operated device.
20. The apparatus of Claim 18 wherein the means for receiving a predetermined signal comprises means for selecting a predetermined character displayed by the user-operated device.
21. The apparatus of Claim 18 wherein the means for receiving a predetermined signal comprises means for placing a cursor at a predetermined coordinate on a display of the user-operated device.
22. The apparatus of Claim 18 wherein the means for receiving a predetermined signal comprises means for receiving a predetermined voice signal from the user of the user-operated device.
23. A device that is operable by a user during an operating session, the device comprising:
 - a user interface configured to provide user-understandable signals and to receive signals from the user; and

a control unit coupled to the user interface, wherein the control unit is configured to:

perform an authentication process with the user, the authentication process determining whether a user attempting to operate the device is an authorized user, wherein an operating session is started if the control unit determines that the user is an authorized user, the device entering an authenticated mode,

measure elapsed time from when the user last operated the device when the device is in the authenticated mode, the elapsed time being reset each time the user operates the device while the device is in the authenticated mode,

suspend the authenticated operating session if the elapsed time measured by the user reaches a first predetermined value, the device entering a suspended mode,

perform an authentication-update process with the user, the authentication-update process determining whether the user is an authorized user, wherein the device re-enters the authenticated mode to continue the operating session if the user completes the authentication-update process before the elapsed time reaches a second predetermined value, and

if the elapsed time exceeds the second predetermined time period, perform the authentication process with the user before re-entering the authenticated mode to continue the operating session.

24. The device of Claim 23 wherein the authentication process comprises:
prompting the user to provide a login entry;
receiving a login entry from the user;
prompting the user to provide a password;
receiving a password from the user; and
verifying that the received login entry and password correspond to an authorized user.

25. The device of Claim 23 wherein the device is further configured to provide a prompt when the device enters the suspended mode.

26. The device of Claim 25 wherein the prompt comprises displaying a plurality of icons.
27. The device of Claim 25 wherein the prompt comprises entering a screen saver mode.
28. The device of Claim 25 wherein the prompt comprises an audio signal.
29. The device of Claim 23 wherein the authentication-update process comprises the user inputting a predetermined signal to the device through the user-interface within the second predetermined time period.
30. The device of Claim 29 wherein inputting a predetermined signal comprises selecting a predetermined icon displayed by the device through the user-interface.
31. The device of Claim 29 wherein inputting a predetermined signal comprises selecting a predetermined character displayed by the device through the user-interface.
32. The device of Claim 29 wherein inputting a predetermined signal comprises placing a cursor at a predetermined coordinate on a display, the display being part of the user-interface.
33. The device of Claim 29 wherein inputting a predetermined signal comprises providing a predetermined audio voice signal to the device through the user-interface.
34. The device of Claim 29 wherein inputting a predetermined signal comprises the user looking at a predetermined character at a location displayed on the user-interface, the user interface being configured to determine the location on the user-interface at which the user is looking.

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
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Abstract Of The Disclosure

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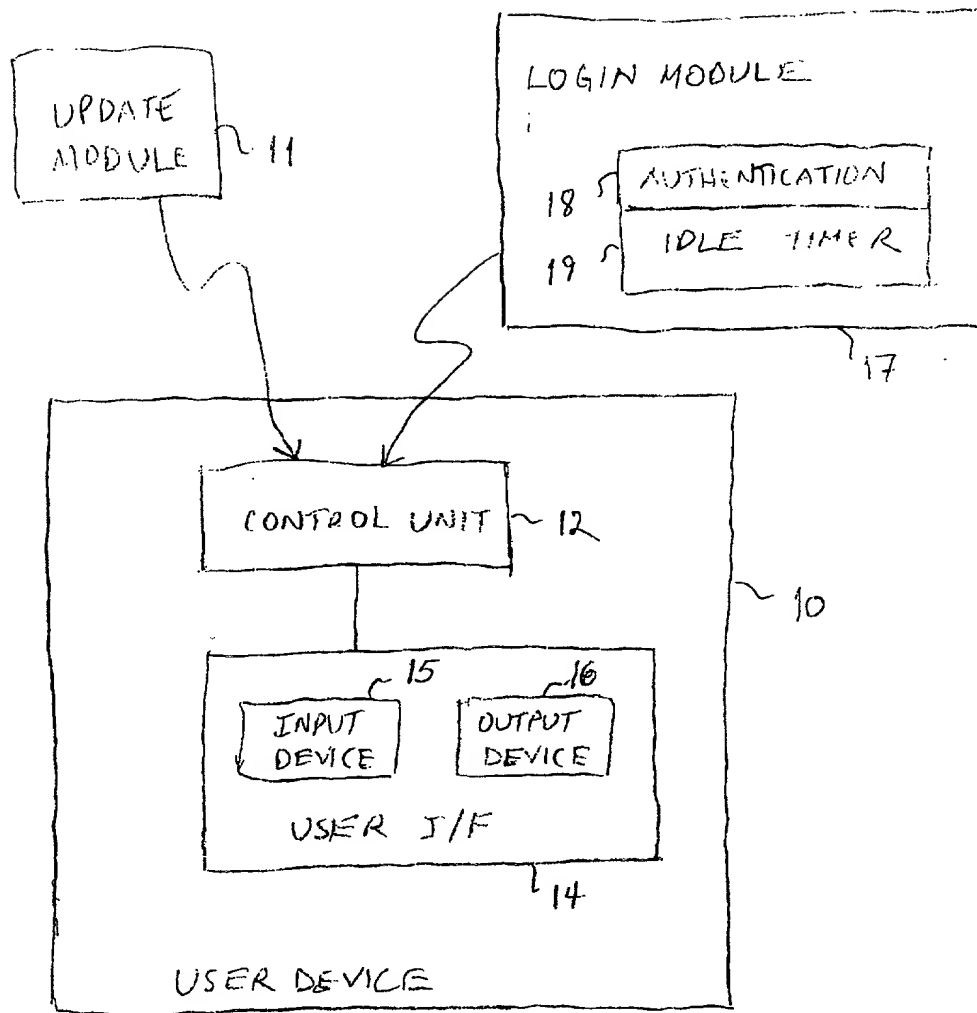
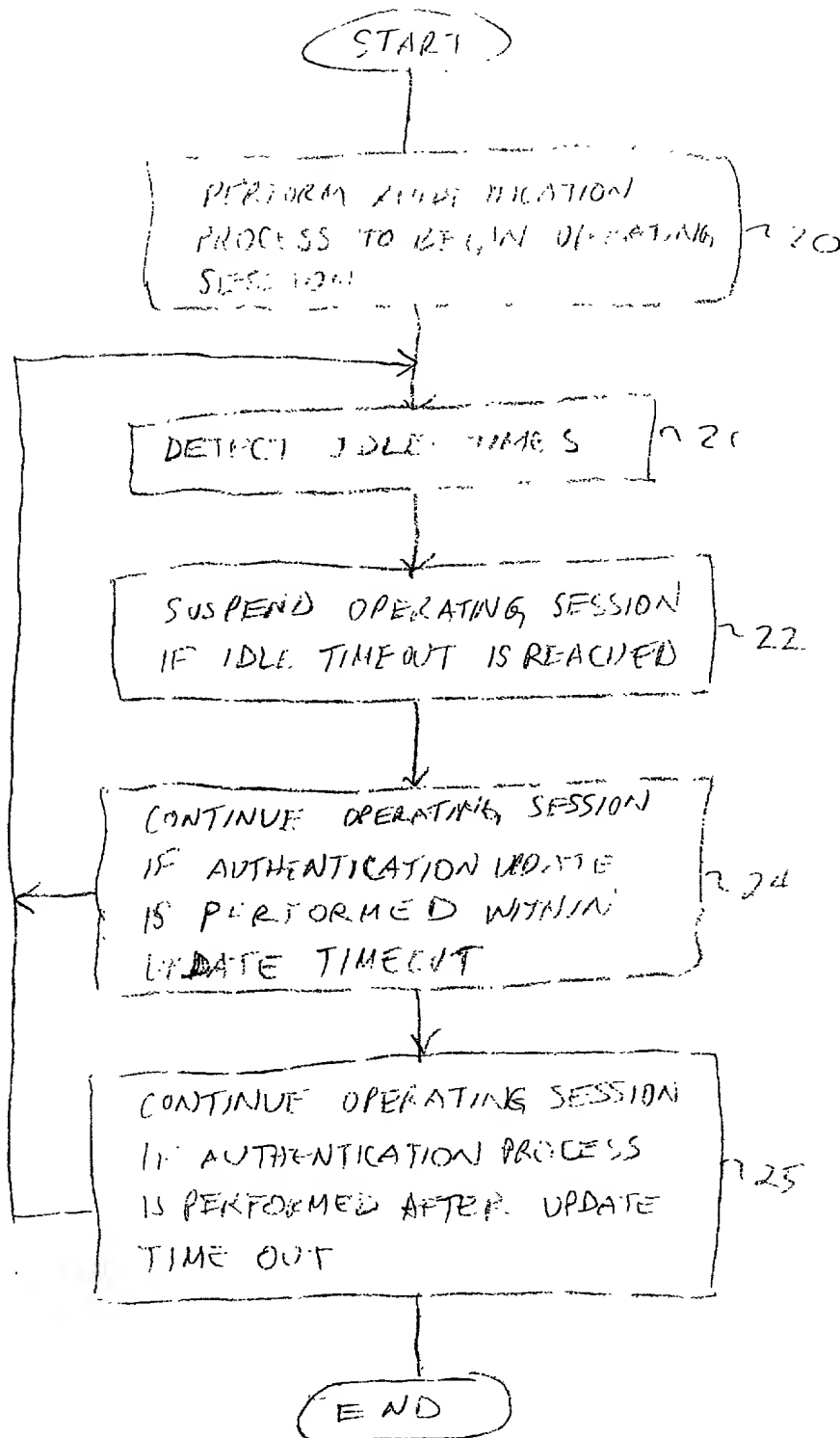


FIG. 1

30 →

FIG. 3

abcdefghijklmnopqrstuvwxyz
uvwxz<>()0123456789
ABCDEFGHIJKLMNQRST
UVWXYZ{}[]!@#\$%^&*+_



MERCHANT & GOULD P.C.

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: OPERATING SESSION REAUTHORIZATION IN A USER-OPERATED DEVICE.

The specification of which

- a. ☒ is attached hereto
b. ☐ was filed on _____ as application serial no. _____ and was amended on _____ (if applicable) (in the case of a PCT-filed application) described and claimed in international no. _____ filed _____ and as amended on _____ (if any), which I have reviewed and for which I solicit a United States patent.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56 (attached hereto).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

- a. ☒ no such applications have been filed.
b. ☐ such applications have been filed as follows:

FOREIGN APPLICATION(S), IF ANY, CLAIMING PRIORITY UNDER 35 USC § 119			
COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)
ALL FOREIGN APPLICATION(S), IF ANY, FILED BEFORE THE PRIORITY APPLICATION(S)			
COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)

I hereby claim the benefit under Title 35, United States Code, § 120/365 of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. APPLICATION NUMBER	DATE OF FILING (day, month, year)	STATUS (patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

U.S. PROVISIONAL APPLICATION NUMBER	DATE OF FILING (Day, Month, Year)

I hereby appoint the following attorney(s) and/or patent agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

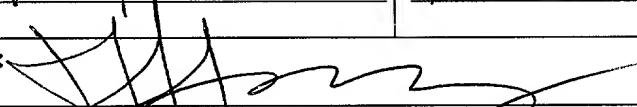
Albrecht, John W.	Reg. No. 40,481	Kowalchyk, Katherine M.	Reg. No. 36,848
Anderson, Gregg I.	Reg. No. 28,828	Lacy, Paul E.	Reg. No. 38,946
Ansems, Gregory M.	Reg. No. 42,264	Larson, James A.	Reg. No. 40,443
Batzli, Brian H.	Reg. No. 32,960	Liepa, Mara E.	Reg. No. 40,066
Beard, John L.	Reg. No. 27,612	Lindquist, Timothy A.	Reg. No. 40,701
Berns, John M.	Reg. No. 43,496	Lycke, Lawrence E.	Reg. No. 38,540
Black, Bruce E.	Reg. No. 41,622	McDonald, Daniel W.	Reg. No. 32,044
Branch, John W.	Reg. No. 41,633	McIntyre, Jr., William F.	Reg. No. P-44,921
Bruess, Steven C.	Reg. No. 34,130	Mueller, Douglas P.	Reg. No. 30,300
Byrne, Linda M.	Reg. No. 32,404	Pauly, Daniel M.	Reg. No. 40,123
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Caspers, Philip P.	Reg. No. 33,227	Plunkett, Theodore	Reg. No. 37,209
Chiapetta, James R.	Reg. No. 39,634	Pytel, Melissa J.	Reg. No. 41,512
Clifford, John A.	Reg. No. 30,247	Reich, John C.	Reg. No. 37,703
Cochran, William W.	Reg. No. 26,652	Reiland, Earl D.	Reg. No. 25,767
Daignault, Ronald A.	Reg. No. 25,968	Schmaltz, David G.	Reg. No. 39,828
Daley, Dennis R.	Reg. No. 34,994	Schuman, Mark D.	Reg. No. 31,197
Dalglish, Leslie E.	Reg. No. 40,579	Schumann, Michael D.	Reg. No. 30,422
Daulton, Julie R.	Reg. No. 36,414	Scull, Timothy B.	Reg. No. 42,137
DeVries Smith, Katherine M.	Reg. No. 42,157	Sebald, Gregory A.	Reg. No. 33,280
DiPietro, Mark J.	Reg. No. 28,707	Skoog, Mark T.	Reg. No. 40,178
Edell, Robert T.	Reg. No. 20,187	Stoll-DeBell, Kirstin L.	Reg. No. 43,164
Epp Ryan, Sandra	Reg. No. 39,667	Storer, Shelley D.	Reg. No. 45,135
Glance, Robert J.	Reg. No. 40,620	Sumner, John P.	Reg. No. 29,114
Goggin, Matthew J.	Reg. No. 44,125	Sumners, John S.	Reg. No. 24,216
Golla, Charles E.	Reg. No. 26,896	Swenson, Erik G.	Reg. No. 45,147
Gorman, Alan G.	Reg. No. 38,472	Tellekson, David K.	Reg. No. 32,314
Gould, John D.	Reg. No. 18,223	Trembath, Jon R.	Reg. No. 38,344
Gregson, Richard	Reg. No. 41,804	Underhill, Albert L.	Reg. No. 27,403
Gresens, John J.	Reg. No. 33,112	Vandenburgh, J. Derek	Reg. No. 32,179
Hamre, Curtis B.	Reg. No. 29,165	Wahl, John R.	Reg. No. 33,044
Hillson, Randall A.	Reg. No. 31,838	Weaver, Karrie G.	Reg. No. 43,245
Holzer, Jr., Richard J.	Reg. No. 42,668	Welter, Paul A.	Reg. No. 20,890
Johnston, Scott W.	Reg. No. 39,721	Whipps, Brian	Reg. No. 43,261
Kadievitch, Natalie D.	Reg. No. 34,196	Wickhem, J. Scot	Reg. No. 41,376
Kastelic, Joseph M.	Reg. No. 37,160	Williams, Douglas J.	Reg. No. 27,054
Karjeker, Shaukat A.	Reg. No. 34,049	Witt, Jonelle	Reg. No. 41,980
Kettelberger, Denise	Reg. No. 33,924	Wu, Tong	Reg. No. 43,361
Keys, Jeramie J.	Reg. No. 42,724	Xu, Min S.	Reg. No. 39,536
Knearl, Homer L.	Reg. No. 21,197	Zeuli, Anthony R.	Reg. No. 45,255
Kowalchyk, Alan W.	Reg. No. 31,535		

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Merchant & Gould P.C. to the contrary.

Please direct all correspondence in this case to Merchant & Gould P.C. at the address indicated below:

Merchant & Gould P.C.
P.O. Box 2903
Minneapolis, MN 55402-0903

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2	Full Name Of Inventor	Family Name TOSEY	First Given Name JOSEPH	Second Given Name P. R.
0	Residence & Citizenship	City NORTH VANCOUVER	State or Foreign Country CANADA	Country of Citizenship CANADA
1	Post Office Address	Post Office Address 3148 Paisley Rd	City North Vancouver	State & Zip Code/Country BC, V7R 1C9 CANADA
Signature of Inventor 201:			Date:	
			April 18/2000	

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